TEXAS AIR CONTROL BOARD
REGULATION III
(31 TAC CHAPTER 113)
CONTROL OF AIR POLLUTION
FROM TOXIC MATERIALS

REVISED MARCH 20, 1981

Preface to Regulation III

This revision incorporates changes adopted by the Texas Air Control Board on March 20, 1981. Pages are dated so that revised pages can be identified.

If you have any questions or suggestions concerning the regulation, please contact Beverly Fowler in the Emissions Standards and Engineering Section of the Texas Air Control Board, 6330 Highway 290 East, Austin, Texas 78723, (512) 451-5711.

TOXIC MATERIALS

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§113.1(131.05.00.001). Purpose.

It is the purpose of this chapter to establish air standards for the State of Texas on inorganic fluoride compounds and beryllium. It is anticipated that additional provisions covering other toxic materials will be adopted as adequate and sufficient data relating to undesirable levels of other toxic materials is developed and evaluated.

§113.2(131.05.00.002). Definitions.

The section on definitions in Chapter 101 of this title (relating to General Rules) applies to this chapter. The additional terms defined in this section have the meanings given them herein when used in this chapter.

Inorganic fluoride compounds - All inorganic chemicals having an atom or atoms of fluorine in their chemical structure.

Forage - Growing, uncut, or unharvested vegetation, in the place where grown, which is, or after harvesting will be, used as food for cattle, horses, sheep, goats, and other livestock, whether it is or will be used on the property where grown or elsewhere.

§113.3(131.05.00.003). Specific Toxic Materials.

(a) Inorganic Fluoride Compounds.

(1) General. It has been established that many types of vegetation absorb inorganic fluoride compounds, especially during their growing season, and particularly when the fluorides are in gaseous form. Generally, the inorganic fluoride compounds are retained in the plant, so that if the plant continues to be exposed to inorganic fluoride compounds, they will become concentrated in the plant's system. For certain susceptible forms of vegetation, the inorganic fluoride compounds can become concentrated to the point where they become toxic to the plant. In addition, certain animals, particularly the bovine species, may develop fluorosis from eating vegetation containing toxic concentrations of inorganic fluoride compounds, whether absorbed in the plant system or merely present externally on the exposed surfaces of the plant. The level of concentration of inorganic fluoride compounds in the atmosphere at which human beings are adversely affected appears to be considerably higher than that at which vegetation and foraging animals are adversely affected. Accordingly, the standards for inorganic fluoride compounds are directed to the protection of vegetation and animal life, and this will help to assure that human beings will be adequately protected.

(2) Ambient Air Quality Standards for Inorganic Fluoride Compounds.

(A) The Board declares that concentrations of gaseous inorganic fluoride compounds in the atmosphere, calculated as HF, in excess of:

(i) 4.5 ppb for any 12-hour period;

(ii) 3.5 ppb for any 24-hour period;

(iii) 2.0 ppb for any 7-day period; or

(iv) 1.0 ppb for any 30-day period; by volume at 760 mm Hg and 25°C average constitute undesirable levels, whether the sources are from natural causes or from the activities of man, and that a state of air pollution exists when concentrations of any gaseous inorganic fluoride compound, calculated as HF, exceed any of these levels.

(B) The Board further declares that concentrations of inorganic fluoride compounds in forage located in a Type D land use area, including inorganic fluoride compounds both absorbed in and deposited on forage, calculated as fluoride ion, in excess of any of the following levels indicated the presence of undesirable levels in the area in which the forage is grown, whether the sources are from natural causes or from the activities of man; and that a state of air pollution exists when concentrations of inorganic fluoride compounds, calculated as fluoride ion, exceed any of the specified levels:

(i) An average of 40 parts per million by weight based on samples taken once a month over a period of 12 consecutive calendar months;

(ii) An average of 60 parts per million by weight based on samples taken once a month over a period of three consecutive calendar months; or

(iii) An average of 80 parts per million by weight based on samples taken once a month over a period of two consecutive calendar months.

(C) Sampling and analyses to determine the concentration of inorganic fluoride compounds in the ambient atmosphere and in forage shall be performed in accordance with Rule 101.14 (relating to Sampling Procedures and Terminology).

(3) Emission Limits for Inorganic Fluoride Compounds.

(A) Inorganic fluoride compounds occur only infrequently in the atmosphere in nature and then usually in small quantities. The occurrence of these compounds is generally the result of the activities of man. While there are areas where cumulative effects from several properties can result in undesirable levels of inorganic fluoride compounds, the emissions usually arise from a single property. Accordingly, the emissions do not as a general rule need to be based on upwind levels of this contaminant. However,

provision is made in this chapter for instances where a cumulative effect results when there are emissions of this contaminant from two or more properties located in close proximity to each other. If the cumulative effects of inorganic fluoride compound emissions cause the ambient air quality standards to be exceeded, the emission limits specified in this chapter will be modified by the Board to prevent the occurrence of undesirable levels of inorganic fluoride compounds.

(B) To assist in meeting the ambient air quality standards specified in §113.3(a)(2) above, the Board hereby establishes a limit on the emission of gaseous inorganic fluoride compounds, calculated as HF, which may be made from any property not to exceed six parts per billion by volume average during a period of three consecutive hours. The contribution of inorganic fluoride compounds by a single property shall be measured by the difference between the upwind level and the downwind level of inorganic fluoride compounds for the property, or by stack sampling calculated to a downwind concentration, in accordance with §113.9(a) of this title (relating to Measuring). It is a violation of this chapter for the contribution from a property, determined in accordance with the applicable rule, to exceed the emission limit specified in this paragraph. The owner, holder or operator of a property is in compliance if the contribution from the property does not exceed the limit specified in §113.3(a)(3)(B).

(b) Beryllium.

(1) The Board declares that the concentration of beryllium in the atmosphere higher than 0.01 microgram average per cubic meter of air based on a 24-hour sample constitutes an undesirable level, and that a state of air pollution exists when the concentration of beryllium exceeds that level.

(2) To assist in meeting the ambient air quality standards specified in paragraph (1) of this subsection, the Board hereby establishes a limit on the emission of beryllium which may be made from any property not to exceed 0.01 microgram average per cubic meter of air during any 24-hour period of time. The contribution of beryllium by a single property shall be measured by the difference between the upwind level and the downwind level of beryllium for the property, or by stack sampling, calculated to a downwind concentration in accordance with the procedures outlined in the applicable appendix of this chapter. It is a violation of this chapter to emit beryllium from a property in excess of the specified limit. The owner, holder or operator of a property is in compliance if the contribution from the property does not exceed the specified limit.

§113.4. Repealed.

§113.5. Repealed.

§113.6. Repealed.

§113.7(131.05.00.007). Calculation of Fluoride Concentration from Stack Samples and Measurements.

(a) The maximum allowable fluoride emission rate which may be made from a stack on a property to comply with the emission limit set forth in §113.3(a)(3) of this title (relating to Specific Toxic Materials) may be calculated by Sutton's Equation which has been modified to consider the critical wind speed and to correspond to a three-hour air sample. The equations used for fluoride for cold and hot stacks are as follows:

(1) For exit stack gas for temperatures of less than 125°F. All land use types:

$$Q_a = 5.8 \times 10^{-5} V_s d_s^2 \frac{1}{\left[\frac{d_s}{h_s}\right]^{1.29}}$$

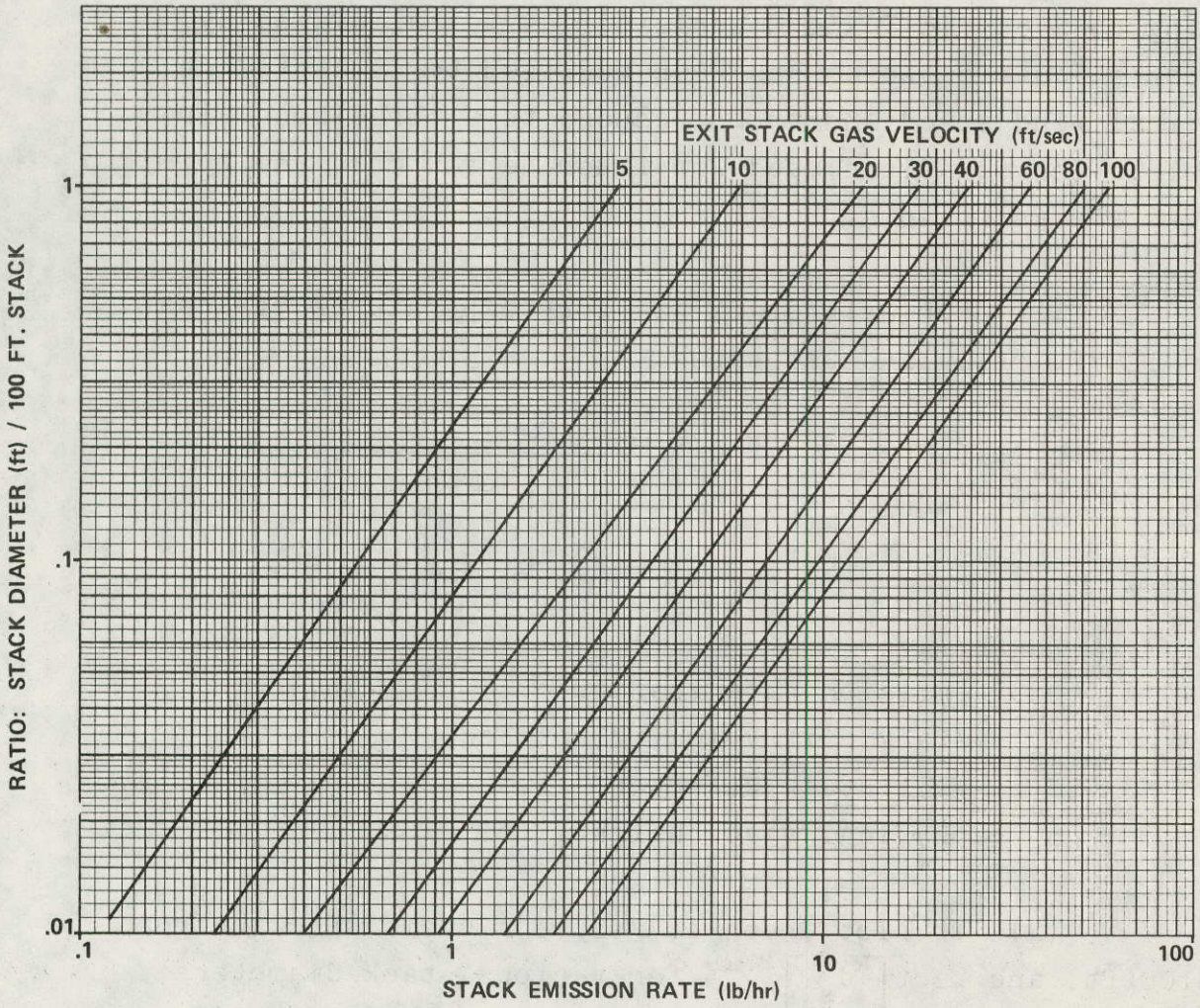
Where:

Q_a = emission rate lbs/hr.
V_s = stack exit velocity, ft/sec.
d_s = exit stack diameter, ft.
h_s = physical stack height, ft.

(2) To plot Graph I, assume a basic stack height of 100 ft. and plot $\left[\frac{d_s}{100}\right]^{1.29}$ for various stack diameters versus stack velocity.

GRAPH I

HYDROGEN FLUORIDE
EXIT TEMPERATURE LESS THAN 125°F



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(3) For exit stack gas for temperatures greater than 125°F. All land types:

$$Q_a = 1.28 \times 10^{-4} V_s d_s \left[1.5 + 0.82 \left(\frac{\Delta T}{T_s} \right) d_s \right] h_s$$

Where:

Q_a = emission rate, lbs/hr.
V_s = stack exit velocity, ft/sec.
d_s = exit stack diameter, ft.
h_s = physical stack height, ft.
ΔT = temperature difference between stack gas and the outdoor temperatures of 90°F (550°R) is assumed in preparing dispersion graphs.
T_s = stack exit temperatures in °Rankine.

(4) To plot Graph II, assume a basic stack height of 100 feet and an exit velocity of 20 ft/sec. Let stack gas temperature vary with stack diameter.

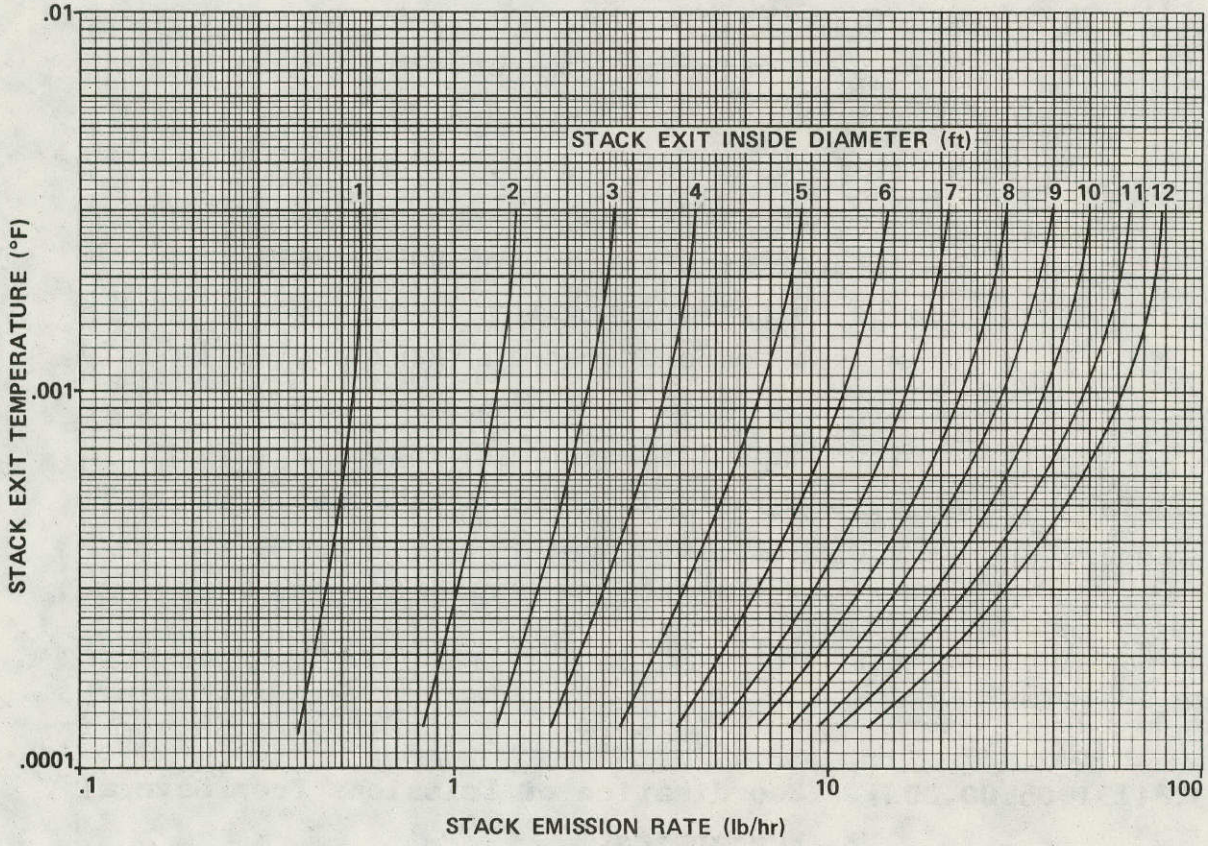
(b) This section shall be reviewed within one year after adoption.

§113.8(131.05.00.008). Coordination of Emissions from Several Properties.

(a) Air Control Zone. The provisions of air control zones, Paragraph V.A. of the General Provisions, apply to this chapter, as appropriate.

GRAPH II

HYDROGEN FLUORIDE
EXIT TEMPERATURE GREATER THAN 125°F



(b) Multiple Air Contaminant Properties. The provisions on multiple air contaminant properties, Paragraph V.B. of the General Provisions, apply to this chapter, as appropriate.

§113.9(131.05.00.009). Measuring and Monitoring.

(a) Measuring.

(1) Where stack sampling is feasible, this is the method preferred by the Board for measuring and controlling emissions. The owner, holder, or operator of the property shall, upon request of the Board, provide in connection with the stack or flue from which the emissions are made such sampling and testing facilities and sampling ports, exclusive of instruments and sensing devices, as may be necessary for the Board to determine the nature and quantity of the toxic materials which are or may be discharged as the result of the operations on the property. The facilities may be either permanent or temporary, at the discretion of the person responsible for their provision, and shall conform to all applicable laws and regulations concerning safe construction and safe practices. Evidence and data based on these stack samples and calculations may be used to substantiate compliance with or violations of this chapter. Agents of the Board shall be permitted to sample the stacks at any reasonable time.

(2) In situations where stack sampling is not feasible, compliance will be determined by the difference between the upwind level and the downwind level of air contaminants for the property. Usually, this method will be

preferred if the contaminants are not emitted through a stack, but rather through the side of a building or through roof vents, or from other ground level sources. This method would also likely be the preferred method if the emissions are made through a large number of flues and stacks so that measurement of each flue and stack individually is not practicable.

(3) Nothing herein precludes the Board from using any appropriate method of measurement as circumstances may dictate, and the owner, holder or operator of the property may use other test methods when approved by the Executive Director. Proper and professional engineering judgment shall be the criterion for determining the method of measurement.

(b) Monitoring for Inorganic Fluoride Compounds.

(1) The owner or operator of a source from which the emissions of gaseous inorganic fluoride compounds, calculated as HF, exceed 3.5 parts per billion average during a period of three consecutive hours more frequently than three times during any 12-month period, shall conduct sampling of the emissions from the source on a periodic, representative basis which will reflect with reasonable accuracy the pattern of the emissions being made.

(2) The owner or operator of a source from which the emissions of an inorganic fluoride compound do not exceed the levels specified in paragraph (1) of this subsection, more frequently than three times during any 12-month period,

shall conduct such sampling and exercise such control as is necessary to assure that the emissions that are made do not exceed the limits specified in §113.3(a)(3) of this title (relating to Specific Toxic Materials) and that the emissions from the property do not exceed the levels specified in paragraph (1) of this subsection, more than three times during any 12-month period.

(3) The results of samples taken pursuant to this subsection shall be recorded, showing the sampling method and procedure used and the quantity of the emissions recorded. The owner, holder or operator of the property shall retain records on the samples for a period not less than 12 months from the date of the sample, and shall make these available to the Board or an agent of the Board on request.

§113.10(131.05.00.010). Use of Air Pollution Control Facilities.

To aid in controlling the overall levels of toxic materials in the atmosphere, the owner, holder, or operator of a property on which are installed air pollution control facilities shall use such facilities whenever emissions of toxic materials are being made which can be controlled by those facilities, even though the ambient air quality standards are not exceeded.

§113.11(131.05.00.011). Exclusion from Application.

Emissions of toxic materials pursuant to and in compliance with the terms of a variance granted by the Board are excluded from the application of this chapter.

§113.12(131.05.00.012). Exceptions.

Emissions of fluoride compounds from a property during periods of inspection, equipment and process malfunctions, and periodic cleaning and maintenance of air control equipment may exceed the limits of §113.3(a)(2) of this title (relating to Specific Toxic Materials), if the Board or Executive Director acting under guidelines established by the Board gives prior approval in writing. Approval may specify emission levels and patterns and duration of emissions which shall be observed.

§113.13(131.05.00.013). Effective Date and Time for Compliance.

(a) This chapter is effective July 30, 1969. The owner, holder, or operator of every property on which one or more sources or potential sources of the air contaminants covered in this chapter is located as of the effective date hereof who can comply with this chapter from and after its effective date without providing new or additional equipment or facilities or modifying existing equipment or facilities shall so comply.

(b) Where new, additional, or modified equipment or facilities must be provided before the owner, holder, or operator of a property can comply with this chapter, the owner, holder, or operator shall comply with the following procedure, as applicable:

(1) If the property will be in compliance with this chapter by January 1, 1970, no further action with respect to the Board is required and the property shall be in compliance by that date.

(2) If the property will not be in compliance with this chapter by January 1, 1970, and emissions of the toxic compounds named above will continue to be made from the property after that date, the person responsible for the property shall file a petition for variance not later than September 1, 1969.

(c) No person may cause, suffer, allow, or permit the emission of any of the named toxic materials covered by this chapter, except as provided in this chapter.

Date Adopted: July 30, 1969
Date Filed with the Secretary of State: September 12, 1969
Date Effective: October 12, 1969

Change in regulation number:
Date Adopted: May 7, 1974
Date Filed with the Secretary of State: May 9, 1974
Date Effective: June 8, 1974

After the effective date of the number change, the title, "Regulation III - Control of Air Pollution from Toxic Materials" shall supersede the title "Regulation V - Control of Air Pollution from Toxic Materials."

Amendment of §§113.3 and 113.9 (131.05.00.003 and 131.05.00.009) and Repeal of §§113.4, 113.5 and 113.6 (131.05.00.004, 131.05.00.005 and 131.05.00.006)
Date Adopted: March 20, 1981
Date Filed with the Secretary of State: April 9, 1981
Date Effective: April 30, 1981

March 20, 1981

REFERENCES

1. Millipore Field Monitors, Cat. #MAWP 037 AO, Millipore Filter Corp., Bedford, Mass. 01730.

2. Standard Method for the Examination of Water and Waste Water APHA, AWWA, WPCF, 12th Edition.

3. Willard-Winter Distillation. Willard, H.H. and Winter, O.B., Volumetric Method for Determination of Fluorine. Ind. Eng. Chem., Anal. Ed. 5 7 (1933).

4. Weinstein, L.H., R.H. Mandl, D.C. McCune, J.S. Jacobson and A.E. Hitchcock. A Semi-automated Method for the Determination of Fluoride in Air and Plant Tissues, "Contrib. Boyce Thompson Inst." 22 (4): 213, October-December, 1963.